CHAPTER 1

Welcome to the GT4500

1.1 Introduction

The **GT4500** is a state of the art PC to TV converter that incorporates **Video Overlay** and titling, making it the ideal solution for in store signs, and training presentations. The OSD Function makes it user friendly. All of this is made possible at an unprecedented price due to high-resolution integrated chip technology. The portable design and user-friendly controls make the GT4500 especially easy to use.

1.2 Product Features

- Pure hardware design, just Plug and Display, no software required.
- Supports resolution up to 1600 x l200.
- On Screen Display (OSD) operation status.
- Power from PS2 or USB port, No need power adaptor.
- Simultaneous display on TV and monitor.
- Supports NTSC, NTSC-EIAJ (for Japan), PAL, PAL-M, PAL-N,
- PAL-combination-N and SECAM (via RGB OUT) video system.
- Supports CVBS, S-VIDEO or RGB video outputs by switch change.
- Simultaneous RGB and CVBS output signal on RGB out connector.
- True 24-bit color digitizer.
- Supports Panel and Remote control.
- Panel Button supports **POWER, GENLOCK, VIDEO SOURCE, FINE TUNE, ZOOM, MENU, and Position** function.
- **GENLOCK** button supports **PC mode, OVERLAY mode, MIX mode, MIX/OVERLAY** mode.
- **Video** source button supports **VIDE01 (CVBS), VIDE02 (S-VIDEO).**
- **MENU** button supports Freeze, **H-SIZE (Horizontal SIZE), V-SIZE (Vertical SIZE),** output **Brightness,** output **Contrast,** output **Hue,** output **Saturation,** output **Flicker,** input **Brightness,** input **Contrast,** input **Hue,** input **Saturation, Color key enable/disable, Luminance key, Red Color key, Green Color Key, Blue color key, MIX ratio, OSD color, Video Standard, Reset & Save.**
- **Video** standard supports **NTSC, NTSC-EIAJ, PAL-M, PAL-N, PAL, PAL-COMBINATION-N.**
- LED indicator lamp on converter: Power, Zoom/Freeze, PAL.
- Adjustable **H-SIZE and V-SIZE.**
- **64 stage** output **Brightness,** output **Contrast,** output **Hue,** output **Saturation, Luminance key, Red Color key, Green Color Key, Blue color key, MIX ratio** adjustment.
- **16 stage Flicker** adjustment.
- **OVERLAY** the external video when match the **color key or luminance key**.
- Remote Controller supports **POWER, 9 AREA ZOOM, Position control, RESET, FREEZE, H-SIZE, V-SIZE, VIDEO SOURCE, VIDEO STANDARD, GENLOCK MODE, MIX ratio, LUMINANCE, PC/VIDEO, CHAR. DISPLAY,** output **CONTRAST, BRIGHTNESS, HUE, SATURATION, SHARPNESS (FINE TUNE), FLICKER** and input **CONTRAST, BRIGHTNESS, HUE, SATURATION** adjustment.

1.3 Modes and Resolution Tables

This converter supports the following VGA display modes:

Resolution	720 x 400	640 x 480	800 x 600	1024 x 768	1152 x 864	1280 x 960	1280 x 1024	1600 x 1200
Vertical Frequency (Hz)	70	60, 70, 72, 75, 85, 100, 120	56, 60, 70, 72, 75, 85, 100	60, 70 72, 75	60, 70 72, 75	60	60	60

This converter supports the following MAC display modes (for MAC G4, G4Cubic, G3)

Resolution	640 x 480	832 x 624	800 x 600	1024 x 768	1152 x 864
Vertical Frequency (Hz)	60, 66, 72, 75, 85, 100, 120	75	56, 60, 72, 75, 85, 100	60, 70, 75	60, 70

This converter fully supports APPLE iMac computer display modes:

| Resolution	640x480	800x600	1024x768
Vertical frequency (Hz)	117	95	75

1.4 System Requirements

- Desktop or Notebook PC compatible with IBM PC or APPLE Macintosh.
- TV or VCR, which supports NTSC or PAL video standard with composite video input, S-Video input, RGB video input or SCART input connector.

1.5 Package Contents

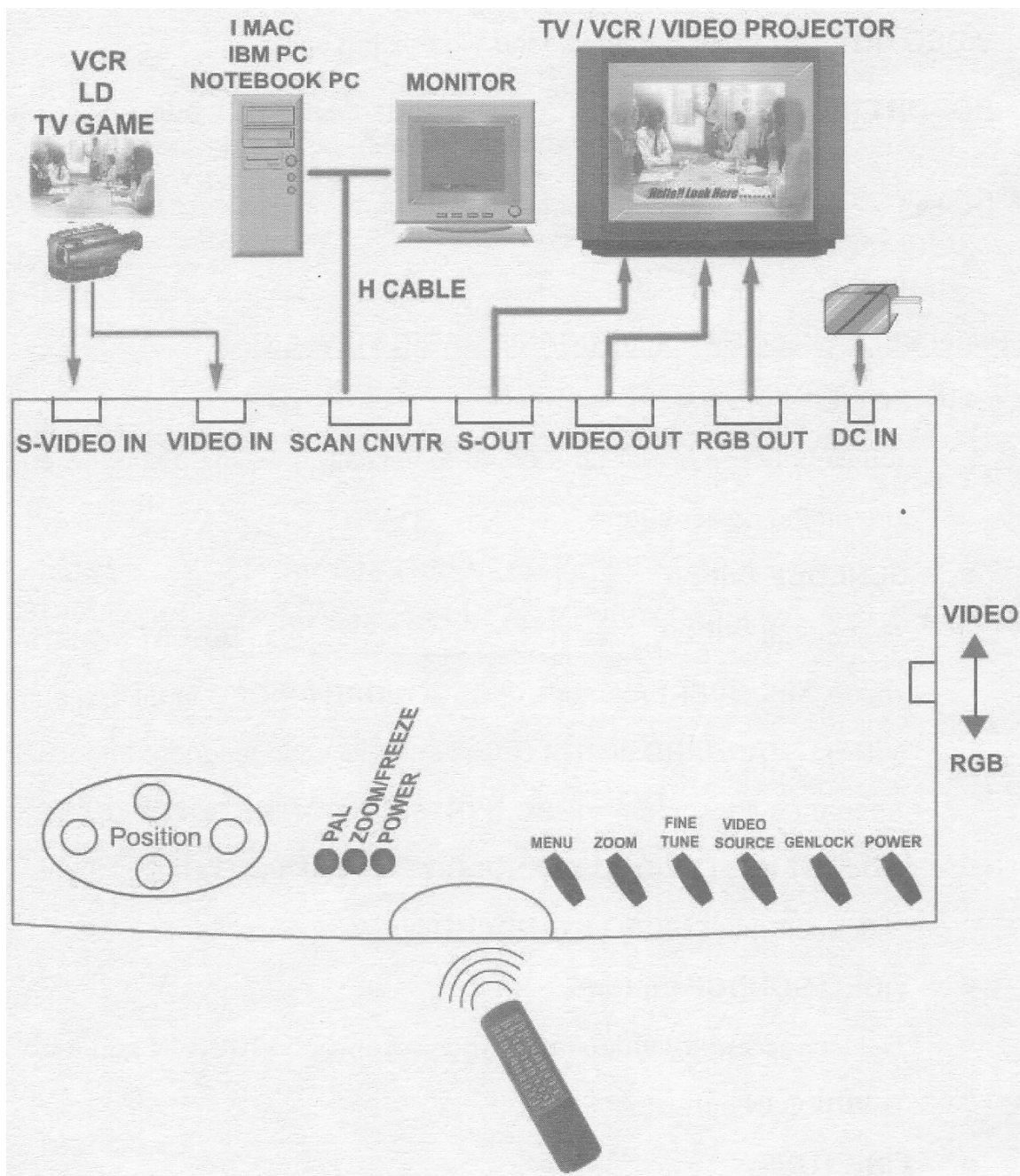This package contains the following items:

- GT4500 PC to TV converter
- Remote controller
- UM-4 Battery x 2
- User's Manual
- S-VIDEO cable
- VIDEO cable
- USB & PS/2 Power cable
- H type VGA cable
- RGB to SCART cable (for Europe only)
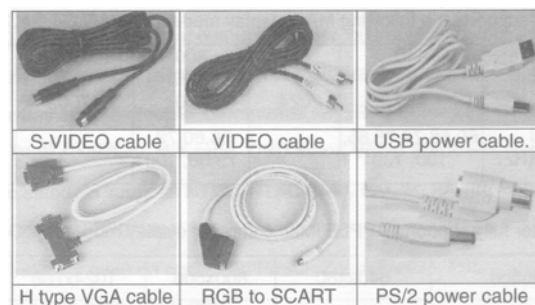
CHAPTER 2

Installing the GT4500

The following section shows the function of controlling the GT4500.

2.1 Connectors of GT4500

Description the function from left to right:

S-VIDEO IN:	External S-Video input, select by video source button, this video can overwrite or mix with PC video.
VIDEO IN:	External composite Video input, select by video source button, this video can overwrite or mix with PC video.
SCAN CNVTR:	Connects to H type VGA cable mark with **SCAN-CNVTR** terminal.
S-OUT:	Connects to the S-video input of TV.
VIDEO OUT:	Connects to the Video input of TV.
RGBOUT (SCART):	Connects to your display device supporting The European SCART connector, or other display device with RGB input.
DC IN:	DC 5V input form keyboard, mouse or USB port of PC.

2.2 Panel Buttons and Switch of GT4500

POWER button	Toggle between power on & of f. Automatically save the setting when you turn off the power button.
GENLOCK button	Press button to change below mode, **PC mode, OVERLAY mode, MIX mode, MIX/OVERLAY** mode. If **SECONDARY VIDEO** input and output **VIDEO STANDARD** are not consistent, this change ignore and a signal appear on the screen "**VIDEO SYSTEM INCONSISTENT PLEASE ADJUST INPUT VIDEO STANDARD**," so you have to adjust input Video format or **VIDEO STANDARD** button to consistent.
VIDEO SOURCE button	Select **secondary video** input, Toggle between **VIDEO IN** port and **S-VIDEO IN** port.
FINE TUNE button	Press this button to fine-tune the video image.
ZOOM button	Toggle between Zoom and Normal display.
POSITION button	Press **UP, DOWN, LEFT and RIGHT** button, the picture will pan to direction which pressed. See the **MENU** button for other functions.
RGB/VIDEO switch	Slide to **RGB** side, only **RGB OUT** connector has function, slide to VIDEO side, only **S-OUT and VIDEO OUT** connector can output signal.
MENU button	Press button to cyclically activate the functions. The functions are **FREEZE, H-SIZE, V-SIZE, VIDEO OUTPUT SETTING (Brightness, Contrast, Hue, Saturation, Sharpness, Flicker), VIDEO INPUT SETTING (Brightness, Contrast, Hue, Saturation), LUMINANCE-COLOR KEY (Luminance, Red, Green, Blue), MIX RATIO, OSD COLOR, Reset and Save.**

FREEZE	Toggle between FREEZE on & off.
H-SIZE	Press **RIGHT** button the Horizontal size is enlarging. Press **LEFT** button the Horizontal size is reducing.
V-SIZE	Press **UP** button the Vertical size is enlarging. Press **DOWN** button the Vertical size is reducing.

VIDEO OUTPUT SETTING	Press **RIGHT** button into VIDEO OUTPUT SETTING. The content includes below item are **Brightness, Contrast, Hue, Saturation, and Flicker.** Where press UP button or **DOWN** button can change these item and press **RIGHT/ LEFT** button to modify value. Press **RIGHT** button to increment, press **LEFT** button to reduce. **Brightness, Contrast, Hue, Saturation** value is from 0 to 63. **FLICKER** value is from 0 to 15. Default value of power on as below. The default value of FLICKER is difference for difference VGA display mode for better picture quality.	

VIDEO OUTPUT

▶	**BRIGHTNESS**	**32**
	CONTRAST	**32**
	HUE	**31**
	SATURATION	**32**
	FLICKER	**10**

VIDEO INPUT SETTING	Press **RIGHT** button into VIDEO INPUT SETTING. The content includes below item are Brightness, Contrast, Hue, Saturation. When press UP button or **DOWN** button can change these item and press **RIGHT/ LEFT** button to modify value. **Press RIGHT** button to increment, press **LEFT** button to reduce. These items value are from 0 to 63. Power on default value as below:	

VIDEO INPUT

▶	**BRIGHTNESS**	**36**
	CONTRAST	**32**
	HUE	**32**
	SATURATION	**32**

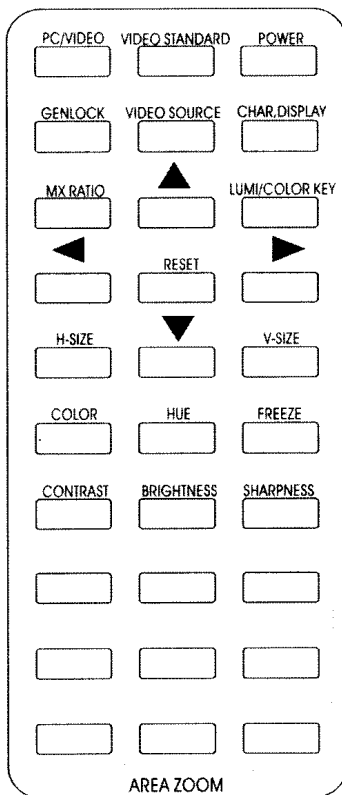|		Press **RIGHT** button into LUMINANCE-COLOR KEY. The content includes below item are **LUMINANCE, RED color, GREEN color, BLUE color**, Where press **UP** button or **DOWN** button can change these item except the luminance is **enable**.

		▶ **LUMI** **DISABLE** **31**
		   RED **DISABLE** **63**
		   GREEN **ENABLE** **63**
		   BLUE **ENABLE** **63**

	LUMINANCE-COLOR KEY	Press **RIGHT** button the cursor is shift to right and it can modify content (DISABLE/ENABLE), press **RIGHT** button again, the cursor is shift to right again except the **DISABLE** status. Press **LEFT** button to shift left of the cursor.
		LUMI ▶ **DISABLE** **31** **LUMI** **ENABLE** ▶ **31**
		When the cursor stay at ENABLE/DISABLE position, press **UP/DOWN** button to change to ENABLE or DISABLE. If the status is enabling, the cursor can move to right (press right button) and it can modify value by **UP/DOWN** button. Press **UP** button the value is increment. Press **DOWN** button the value is decrement.
	MIX RATIO	Press **UP** button to increment value. Press **DOWN** button to reduce value. The value is from 0 to 63. Power on default value is 31. Increment this value can increase weight of PC video. Reduce this value can increase weight of Secondary video.
	OSD COLOR	Press UP button to increment value to change OSD color. Press DOWN button to reduce value. The value is from 0 to 15.
	RESET	Press **UP/ DOWN** button can reset the **SCREEN POSITION, VIDEO OUTPUT SETTING, VIDEO INPUT SETTING, MIX RATIO** and **OSD COLOR** to **default** value.
	SAVE	Press **UP/DOWN** button to save the setting.

2.3 Remote controller function button

POWER	Toggle between power on & off.
GENLOCK	Press button to change below mode, PC mode, OVERLAY mode, MIX mode, MIX/OVERLAY mode. If SECONDARY VIDEO input and output VIDEO STANDARD are not consistent, this change ignore and screen show "VIDEO SYSTEM INCONSISTENT PLEASE ADJUST INPUT VIDEO STANDARD", so you have to adjust input video format or output VIDEO STANDARD to consistent.
VIDEO SOURCE	Select **secondary video** input, Toggle between **VIDEO IN** port and **S-VIDEO IN** port.
VIDEO STANDARD	This button selects the video standard. Which includes the following six video standards, **"NTSC, NTSC-EIAJ, PAL-M, PAL-N, PAL, PAL combination N".** The refresh rate of **NTSC, NTSC-EIAJ and PAL-M** is 60Hz; the refresh rate of **PAL-N, PAL and PAL combination N** is 50Hz.
PC / VIDEO	Toggle between PC video and external video (secondary video refer to video source button).
CHAR. DISPLAY	Toggle between appears or not appear "GENLOCK" word.
RESET	Reset the **SCREEN POSITION, VIDEO OUTPUT SETTING, VIDEO INPUT SETTING, MIX RATIO** and **OSD COLOR** to **default** value.
UP, DOWN, LEFT, RIGHT	Refer to Converter panel button or other button.
H-SIZE	Press **RIGHT** button the Horizontal size is enlarging. Press **LEFT** button the Horizontal size is reducing.

V-SIZE	Press UP button the Vertical size is enlarging. Press **DOWN** button the Vertical size is reducing.
MIX RATIO	To adjustment MIX ratio and Press UP button to increment value. Press **DOWN** button to reduce value. The value is from 0 to 63. Power on default value is 31. Increment this value can increase PC image, Reduce this can increase Secondary video.

LUMI/COLOR KEY	To setting OVERLAY color. The secondary video overwrites the PC signal when PC color match setting color.
	
	    ▶ **LUMI** **DISABLE** **31**
	       RED **DISABLE** **63**
	       GREEN **ENABLE** **63**
	       BLUE **ENABLE** **63**
	
	Press **RIGHT** button the cursor is shift to right and it can modify content (DISABLE/ ENABLE), press **RIGHT** button again, the cursor is shift to right again except the **DISABLE** status. Press **LEFT** button to shift left of the cursor.
	
	    LUMI ▶ **DISABLE** **31**
	
	    LUMI **ENABLE** ▶ **31**
	
	When the cursor stay at ENABLE/ DISABLE position, press **UP/ DOWN** button to change to ENABLE or DISABLE. If the status is enabling, the cursor can move to right (press right button) and it can modify value by **UP/DOWN** button. Press UP button the value is increment. Press **DOWN** button the value is decrement.

BRIGHTNESS	Press button once if appear "video output setting" frame then press button again it appear "video input setting" frame.
	
	VIDEO OUTPUT
	▶ **BRIGHTNESS** **32**
	   CONTRAST **32**
	   HUE **31**
	   SATURATION **32**
	   FLICKER **10**
	
	VIDEO INPUT
	▶ **BRIGHTNESS** **36**
	   CONTRAST **32**
	   HUE **32**
	   SATURATION **32**
	
	Press **RIGHT** button the **BRIGHTNESS value** is increase. Press **LEFT** button the **BRIGTHNESS value** is decrease.

CONTRAST	Press button once if appear "video output setting" frame then press button again it appear "video input setting" frame.
	
	VIDEO OUTPUT
	   BRIGHTNESS **32**
	▶ **CONTRAST** **32**
	   HUE **31**
	   SATURATION **32**
	   FLICKER **10**
	
	VIDEO INPUT
	   BRIGHTNESS **36**
	▶ **CONTRAST** **32**
	   HUE **32**
	   SATURATION **32**
	
	Press **RIGHT** button the **CONTRAST value** is increase. Press **LEFT** button the **CONTRAST value** is decrease.

HUE	Press button once if appear "video output setting" frame then press button again it appear "video input setting" frame. **VIDEO OUTPUT** **VIDEO INPUT** 　　　BRIGHTNESS　32　　　　BRIGHTNESS　36 　　　CONTRAST　32　　　　CONTRAST　32 ▸ HUE　31　▸ HUE　32 　　　SATURATION　32　　　SATURATION　32 　　　FLICKER　10 Press **RIGHT** button the **HUE value** is increase. Press **LEFT** button the **HUE value** is decrease.
COLOR	Press button once if appear "video output setting" frame then press button again it appear "video input setting" frame. **VIDEO OUTPUT** **VIDEO INPUT** 　　　BRIGHTNESS　32　　　BRIGHTNESS　36 　　　CONTRAST　32　　　CONTRAST　32 　　　HUE　31　　　HUE　32 ▸ SATURATION　32　▸ SATURATION　32 　　　FLICKER　10 Press **RIGHT** button the **SATURATION value** is increase. Press **LEFT** button the **SATURATION value** is decrease.
FINE TUNE	Press this button to fine-tune the video image.
FLICKER	Press button to adjustment **FLICKER value.** **VIDEO OUTPUT** 　　　BRIGHTNESS　32 　　　CONTRAST　32 　　　HUE　31 　　　SATURATION　32 ▸ FLICKER　10 Press **RIGHT** button the **FLICKER value** is increase. Press **LEFT** button the **FLICKER value** is decrease. **PS:** When change the VGA display mode, the value return to default.
FREEZE	Toggle between FREEZE on & off.
AREA ZOOM	Press these button once the frame is zoom * 2, press button again return back normal frame. These button zoom area refer to their position on remote controller.

2.4 How to use The OVERLAY Function

1. Please press **GENLOCK** button on PANEL or Remote Controller to OVERLAY mode. (Note: the external video and video standard need to consistent, then you can select to overlay mode, otherwise you must to press **video standard button** to select video standard)

2. Second please press **LUMI/COLOR KEY** button of Remote Controller or press MENU button of PANEL button to LUMINANCE-COLOR KEY item and press RIGHT button into OVERLAY set color frame. As below:

   > **LUMI**   **DISABLE**   **31**
   > **RED**   **ENABLE**   **63**
   > **GREEN**   **ENABLE**   **63**
   > **BLUE**   **DISABLE**   **63**

3. Press **RIGHT** button the cursor is shift to right and it can modify content (DISABLE/ ENABLE), press **RIGHT** button again, the cursor is shift to right again except the **DISABLE** status. Press **LEFT** button to shift left of the cursor.

   LUMI ▶ **DISABLE**   **31**

   LUMI   **ENABLE** ▶ **31**

   When the cursor stay at ENABLE/ DISABLE position, press **UP/ DOWN** button to change to ENABLE or DISABLE. If the status is enabling, the cursor can move to right (press right button) and it can modify value by **UP/ DOWN** button. Press UP button the value is increment. Press **DOWN** button the value is decrement.

   LUMI   **ENABLE** ▶ **32**

4. When **LUMI** is **ENABLE**, the cursor cannot to change other item (**RED, GREEN, BLUE**). When **LUMI** is DISABLE, the cursor can move to other item by **UP/DOWN** button and you can modify the status and value of item:

   > **LUMI**   **DISABLE**   **31**
   > **RED**   **ENABLE**   **63**
   > **GREEN**   **ENABLE**   **63**
   > **BLUE**   **DISABLE**   **63**

5. Adjust the LUMI value (LUMINANCE), the RED, GREEN, BLUE value adjust together.

6. You can set any color for OVERLAY function. RED, GREEN, BLUE the value from 0 to 63 (color 0~255). The external video overwrites the PC signal when PC color match setting color.

7. Example: **You can draw a picture (picture 1) with** POWER POINT. If the overlay color is YELLOW. (**YELLOW** means set **RED** value to 63, **GREEN** value to 63, **BLUE** value to 0). PC signal is picture 1 (background color is yellow and appear blue word "WONDERFUL"). The external video is picture 2; therefore GT4500 video output is picture 3.

WONDERFUL

picture 1

picture 2

WONDERFUL

the background
not appear

picture 3
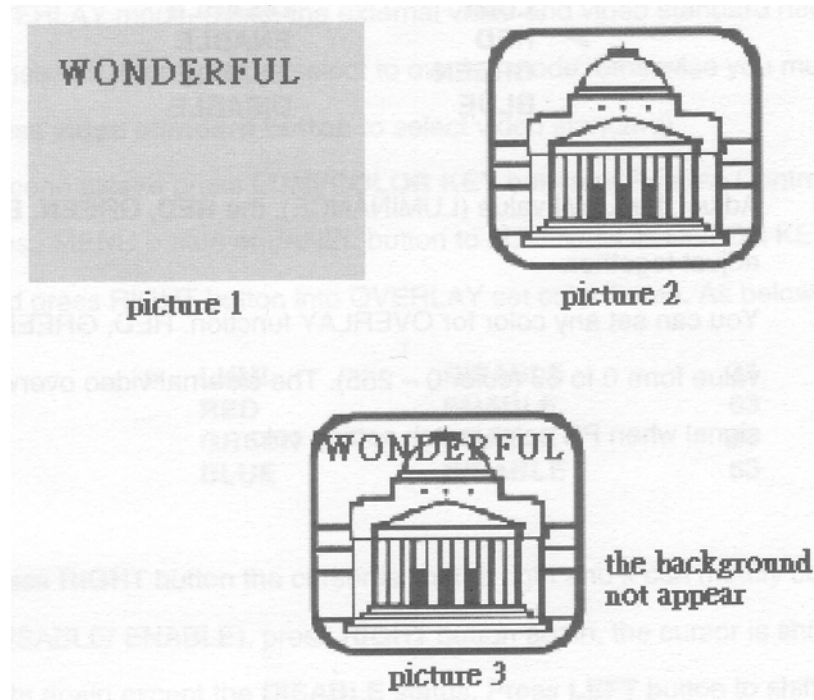
CHAPTER 3

Frequently Asked Questions

The following are problems that might arise when using the PC to TV converter, and possible solutions to them.

Q: **How can I enhance the display quality?**

A: You can usually decrease the TV contrast and increase brightness control to get the better picture.

Q: **I have an older model of a television in my classroom. Would I be able to use my video converter with a television as old as this one?**

A: Yes, you may need a special adapter called on **RF modulator.** This device converts the composite video signal from your video converter to an Antenna signal, which can be viewed on your TV using Channel 3 or 4 or 13.

Q: **What is OVERLAY mode?**

A: Secondary video can replace the PC VIDEO when match the Luminance key or Color key. For example, you can choose pure BLUE color as key color and make background as BLUE color for PC image, you can see the BLUE color replace by secondary video on output.

Q: **What is MIX mode?**

A: MIX mode can mix Secondary video and PC VIDEO then output to TV.

Q: **What is OVERLAY-MIX mode?**

A: Secondary video can replace the PC VIDEO when match the Luminance key or Color key. Other part of secondary video mix with PC VIDEO, the ratio depends on Mixer Ratio setting.

Q: **What is LUMINANCE?**

A: Luminance is gray part of color. It is combined of primary color (RED, GREEN, BLUE).
   LUMINANCE $(Y) = 0.3*RED + 0.59*GREEN + 0.11 *BLUE$

Q: **Can I use multiple televisions to view the same image from my computer?**

A: Yes, You may connect one television to the next using a composite video cable or an S-Video between the "VIDEO IN" and "VIDEO OUT" ports. We recommend using no more than five or six televisions.
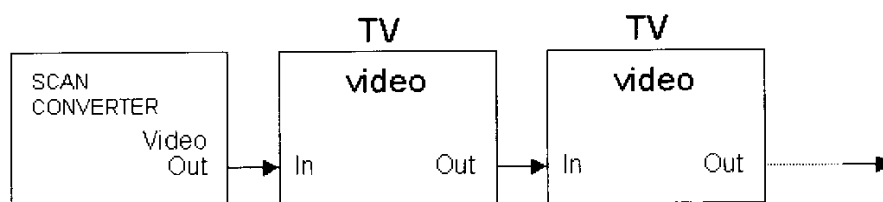
CHAPTER 4

Technical Specifications

4.1 VGA IN Connector

Analog RGB and SYNC signal from 15-pin VGA output port of PC or Notebook PC, and output SYNC signal to monitor.

Pin No.	Signal Description
1	RED IN, 0.7Vpp ± 0.1Vpp, 75 ohms, from PC
2	GREEN IN, 0.7Vpp ± 0.1Vpp, 75 ohms, from PC
3	BLUE IN, 0.7Vpp ± 0.1Vpp, 75 ohms, from PC
4	No connection
5	Monitor Sense, TTL level, active low
6	Ground
7	Ground
8	Ground
9	No connection
10	Ground
11	HSYNC OUT, TTL level, buffered HSYNC IN, to monitor
12	VSYNC OUT, TTL level, buffered VSYNC IN, to monitor
13	HSYNC IN, TTL level
14	VSYNC IN, TTL level
15	No connection
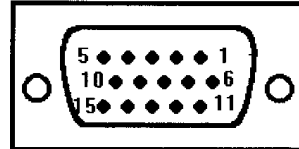
Remark: Case is connected to ground

4.2 RGB OUT

RGB OUT is 9-pin mini-DIN type female connector. It can output RGB and Composite VIDEO signal. Detail description as below: Slide the **RGB/VIDEO** switch to **RGB** side can enable this connector. This connector cannot work with **S-OUT** and **VIDEO OUT** simultaneous. This connector is very useful with Europe's TV and SCART connector.

Pin No.	Signal Description
1	Blue output, 0.7Vpp, 75 ohms
2	No connection
3	Green output, 0.7Vpp, 75 ohms
4	Composite VIDEO, negative sync, 1Vpp
5	No connection
6	+5V
7	Red output, 0.7Vpp, 75 ohms
8	No connection
9	No connection
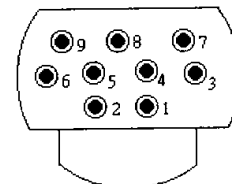
Remark: Case is connected to ground

4.3 S-OUT connector

S-OUT is a 4-pin mini-DIN connector.

Pin No.	Signal Description
1	GND
2	GND
3	Y (Luminance), 0.7 Vpp ± 0.2 Vpp, 75 Ω, negative sync
4	C (Chrominance), 0.3 Vpp ± 0.1 Vpp
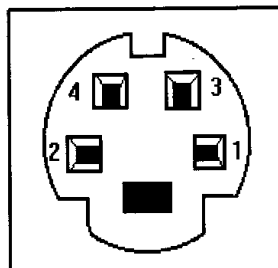
4.4 VIDEO OUT connector

Composite video out, 1.0Vpp ±0.2Vpp 75 ohms, negative sync.

4.5 S-VIDEO IN connector

S-VIDEO IN connector is a 4-pin mini-DIN connector.

Pin No.	Signal Description
1	GND
2	GND
3	Y (Luminance), 0.7 Vpp ± 0.2 Vpp, 75 Ω, negative sync
4	C (Chrominance), 0.3 Vpp ± 0.1 Vpp
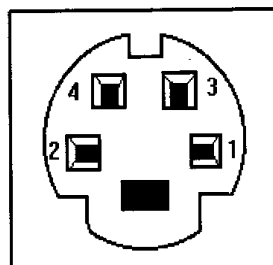
4.6 VIDEO IN connector
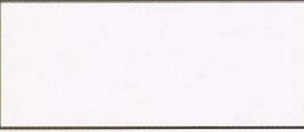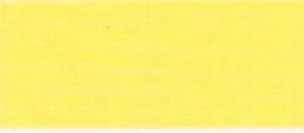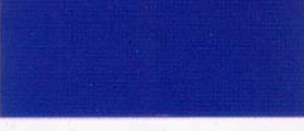
Composite video in, 1.0Vpp ±0.2Vpp 75 ohms, negative sync.

4.7 DC IN connector

Power supply to this converter. Input with **regulated DC 5V**. Power consumption is DC 5V, 360mA, standby current is 220mA.

Appendix

Sketch 1 – Overlay Color Setting

R: 28 /128 G: 27 /128 B: 29 /128		R: 54 /255 G: 53 /255 B: 58 /255	
R: 02 /0 G: 53 /255 B: 58 /255		R: 54 /255 G: 53 /255 B: 29 /128	
R: 54 /255 G: 02 /0 B: 58 /255		R: 54 /255 G: 27/128 B: 16 /64	
R: 54 /255 G: 53 /255 B: 0 /0		R: 02 /0 G: 54 /255 B: 30 /128	
R: 02 /0 G: 02 /0 B: 58 /255		R: 27 /128 G: 27 /128 B: 16 /64	
R: 02 /0 G: 53 /255 B: 02 /0		R: 54 /255 G: 02 /0 B: 30 /128	
R: 54 /255 G: 02 /0 B: 02 /0		R: 27 /128 G: 02 /0 B: 58 /255	
R: 0 /0 G: 0 /0 B: 0 /0		R: 27 /128 G: 14 /64 B: 02 /0	

Please refer to above color value (RGB) to make an adjustment on the overlay of the GT4500.
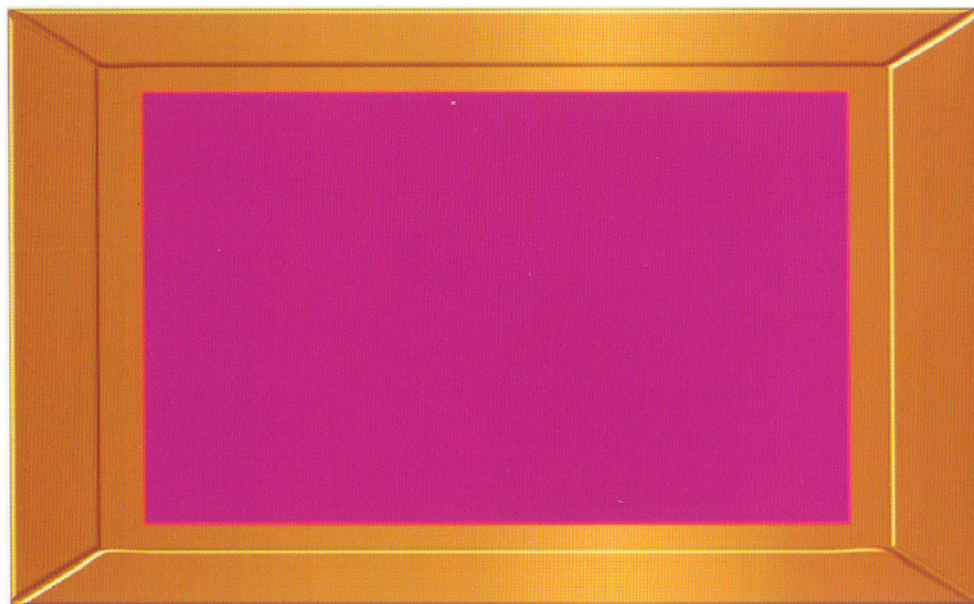
Red value: Color setup for the converter

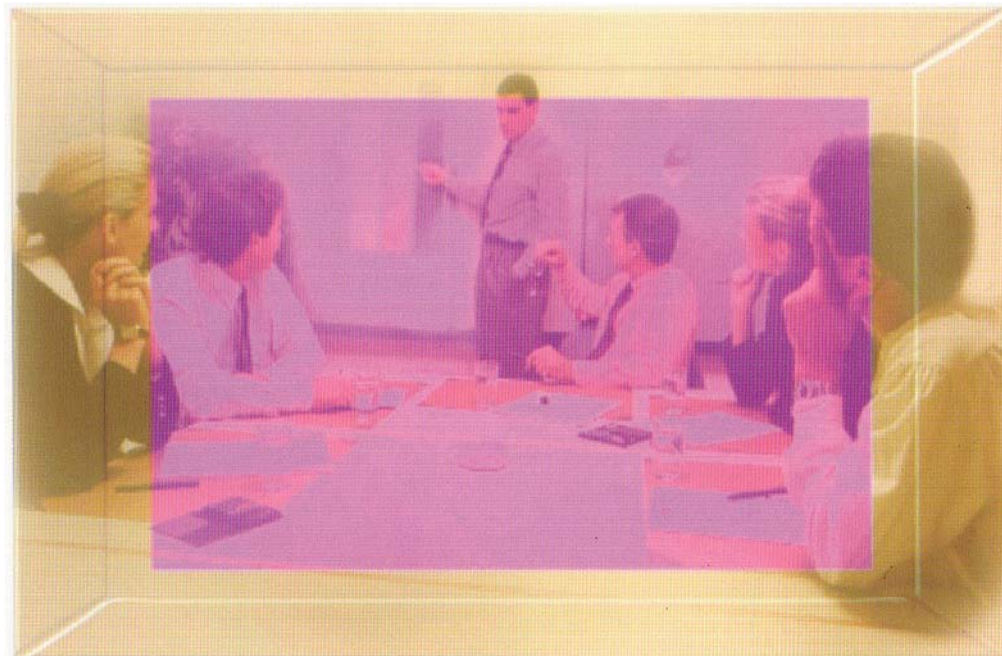Navy value: Actual color for PC setup

Sketch 2 – Video Image Input

Sketch 3 – PC Signal Input

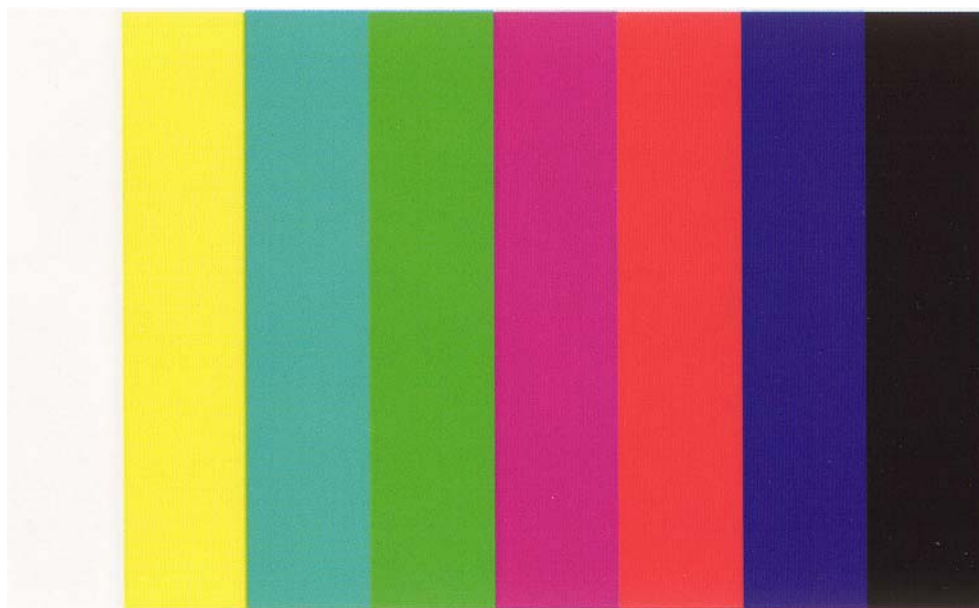Sketch 4 – Overlay Mode Output (Sketch 2 + Sketch 3)

Sketch 5 – Mixer Mode Output (Sketch 2 + Sketch 3)

Sketch 6 – Overlay-Mixer Mode Output (Sketch 2 + Sketch 3)
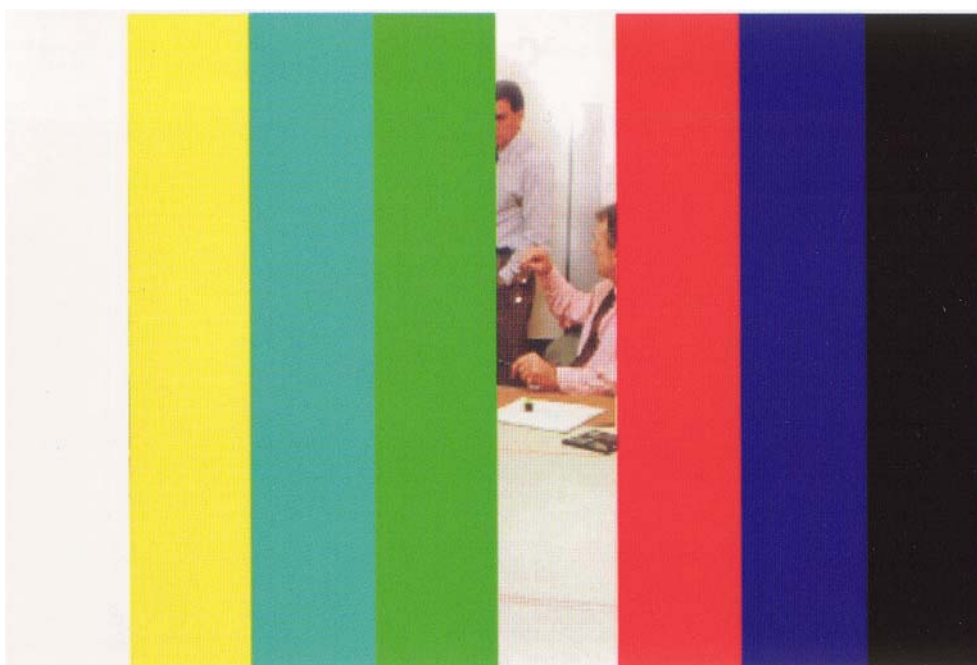

Sketch 7 – PC Signal Input

Sketch 8 – Mixer Mode Output (Sketch 2 + Sketch 7)

Sketch 9 – Overlay Mode Output (Sketch 2 + Sketch 7)

Sketch 10 – PC Signal Input

Sketch 11 – Overlay Mode Output (Sketch 2 + Sketch 10)